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EXAMINER

RECORDED 111-5

ART UNIT

PAPER NUMBER

1107

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action SummaryApplication No.
08/720,693Applicant(s)
Kao et alExaminer
George FoursonGroup Art Unit
1107☒ Responsive to communication(s) filed on Nov 10, 1997☐ This action is **FINAL**.☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims☒ Claim(s) 1-42 is/are pending in the application.Of the above, claim(s) 34-42, as drawn to a non-elected species is/are withdrawn from consideration.☐ Claim(s) _____ is/are allowed.☒ Claim(s) 1-33 is/are rejected.☐ Claim(s) _____ is/are objected to.☐ Claims _____ are subject to restriction or election requirement.**Application Papers**☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.☐ The drawing(s) filed on _____ is/are objected to by the Examiner.☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.☐ The specification is objected to by the Examiner.☐ The oath or declaration is objected to by the Examiner.**Priority under 35 U.S.C. § 119**☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.☐ received in Application No. (Series Code/Serial Number) _____☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).**Attachment(s)**☐ Notice of References Cited, PTO-892☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____☐ Interview Summary, PTO-413☐ Notice of Draftsperson's Patent Drawing Review, PTO-948☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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Claims 1-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 3, the use of "selected" reads on a nebulous mental step conducted prior to the manipulative steps of the claimed invention, hence rendering the present process claims unclear in meaning and scope. If applicant wishes to patent detailed controls over the recited process, they must be positively recited. In claim 5, line 3, it appears that --said-- should precede "bombarding". Similar change should be made in claims 13, 15, 22, 26 and 28 if the steps being recited are not additional steps beyond those recited in the claims they depend on. In claim 8, it is questioned what is recited through use of "composed", specifically whether "comprised" or "consisting of" is intended. In claim 13, it is questioned what is recited through use of "through the pad oxide layer". In claim 14, it is questioned what is recited through use of "substrate assembly is oriented in a major plane" and therefore what is recited by the rest of the claim.

In claim 20, line 4, the use of "selected" reads on a nebulous mental step conducted prior to the manipulative steps of the claimed invention, hence rendering the present process claims unclear in meaning and scope. In claim 23, it is questioned what is recited through use of "composed", specifically whether "comprised" or "consisting of" is intended. In claim 28, it is questioned what is recited through use of "substrate assembly is oriented in a major plane" and therefore what is recited by the rest of the claim.

In claim 32 the use of "selected" reads on a nebulous mental step conducted prior to the manipulative steps of the claimed invention, hence rendering the present process claims unclear in meaning and scope. In claim 32, it is questioned what is recited through use of "substrate assembly is

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oriented in a major plane" and therefore what is recited bylines 15-18 of the claim.

Claims 2 and 9 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The implantation of ions of the semiconductor material as in claim 1 would not change the "electrical charge characteristics" which is understood to be the conductivity type of the semiconductor material. It appears that claim 9 is directed to the cross section of the device formed and does not limit the steps of claim 7.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6,11,13,14,15,16,17,20,21,24,26,29,30 and 31 are rejected under 35 U.S.C. 102(b) as

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being clearly anticipated by Japanese Patent 62-48028.

Claims 7,8,9,10,22,23 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '028 as applied to claims 1-6,11,13,14,15,16,17,20,21,24,26,29,30 and 31 above, and further in view of Japanese Patent 63-300526.

Japan '028 discloses use of photoresist as the spacer material as opposed to silicon nitride. The use of silicon nitride in the process of spacing an implanted region from the edge of an oxidation mask is disclosed by Japanese Patent '526. It would have been within the scope of one of ordinary skill in the art to employ silicon nitride as the spacer material in the process of Japanese Patent '028 to allow spacing of the implanted silicon ions from the edges of the mask opening.

Claims 12,18,19,24,25,27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent '028 as applied to claims 1-6,11,13,14,15,16,17,20,21,24,26,29,30 and 31 above, and further in view of the following comments.

Japanese Patent '028 discloses removal of the photoresist mask prior to the bombarding. However, It would have been within the scope of one of ordinary skill in the art to allow the mask to remain under the second photoresist mask in view of the disclosure that photoresist masks can be used as an implantation mask. It appears that the process would be performed equal well with such a modification and that the modification does not solve any stated problems or have any advantages. Japan '028 does not disclose the pressure of oxidation. The examiner takes official notice that pressures within the ranges

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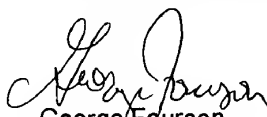
recited in claims 18 and 19 are employed in LOCOS processes. It would have been within the scope of one of ordinary skill in the art to employ such pressures to allow oxidation to be performed. It would have been within the scope of one of ordinary skill in the art to determine a suitable opening size between the spacers which choice would depend on the desired device density and degree of isolation on the finished wafer. Removal of the pad oxide layer in the opening would be a matter of choice as the oxidation could be performed equally well in either event since the oxide would be reformed in the initial stages of oxidation if removed.

~~The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.~~

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0661. **See MPEP 203.08.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner George Fourson whose telephone number is (703) 308-2544. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on (703) 308-3325. The fax number for this group is (703)305-3599. MPEP 502.01 contains instructions regarding procedures used in submitting responses by facsimile transmission.


George Fourson
Primary Examiner
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George Fourson
February 12, 1998